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New Advancements in 3D Printing to Improve Speed and Scale

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As part of our efforts to advance additive manufacturing, we are continually researching ways in which we can help push the 3D printing industry forward. We believe that the intersection between software, hardware and materials is where we can make a difference.

Autodesk initially announced Spark (https://spark.autodesk.com/), the open 3D printing platform, and Ember (https://ember.autodesk.com/), the open 3D printer, back in 2014, and we've continued to focus our efforts on transforming the additive manufacturing ecosystem.



For additive manufacturing to play its critical role in the future of making things, we need to solve some fundamental problems that will drive innovation across the industry and unlock the potential for our customers to develop more advanced products, parts and components.

There is a lot of work happening here at Autodesk on that front. Recently we've been pushing on three key areas:

Autodesk investments in 3D Printing with the Spark Investment Fund

Building on several early investments with companies such as Voxel8, Source3, Optomec, Autodesk is now investing in XJet, an Israeli-based company focused on launching the first metal 3D printer that uses inkjet printing technology and liquid metals to 3D print objects in less time. The company has secured \$25 million in this current round of investments and plans to use the funding to launch XJet products in key international markets.

XJet's ground-breaking technology called NanoParticle Jetting uses nanoparticles in liquid suspension to build 3D metal parts. The technology enables a far more accurate production of highly complex parts than is possible with current technologies.



Continuing Advancements and Open Releases with Ember

Autodesk has now demonstrated that printing at the speed of 440mm/hour is possible with a change to Ember settings. Autodesk is also releasing the research on the formulation for PR48-high speed, a resin formulation we developed as part of our efforts in speeding up the 3D printing process to address a common challenge within the industry. PR48-high speed is faster compared to Ember's other resin, PR48-clear. With this resin formulation, along with optimized hardware and software, print speed has increased from 18mm/hour to 440mm/hour – 24 times faster.

As part of our open approach, we're publishing the resin formulation, along with guidelines on how to optimize the hardware and software aspects to best accommodate the resin. The guidelines can be found on Instructables (http://www.instructables.com/id/How-to-Configure-Ember-for-High-Speed-3D-Printing/).



Because Ember is an open 3D printer with connected hardware, software and materials, we are seeing our customers build out new capabilities as shown by the team from Origin.

Origin (http://www.madebyorigin.com/) is a San Francisco-based start-up focused on revolutionizing the manufacturing experience for companies by leveraging Ember's open system. Origin's platform allows customers to prototype and scale the production of their own products with the speed, customization, and flexibility missing from traditional manufacturing. Enabling Origin's production capabilities is a process based on Ember, Autodesk's open 3D printer that results in commercial-grade products.

In collaboration with Chronicled, Inc., Origin produced the 3D-printed smart tags for Marshawn Lynch's Beast Mode shoes (http://www.greats.com/products/beastmode), providing consumers with the ability to authenticate collectible sneakers. Consumers could then hold an iPhone or Android over the smart tag to display the digital

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New Advancements in 3D Printing to Improve Speed and Scale | Spark - an open platform for connecting the 3D Printing ecosystem profile assigned to each pair. Chronicled now takes advantage of Origin and Ember's capabilities by allowing customers to rapidly customize their products with unique logos, colors, and form factors.



Speeding Up and Scaling 3D Printing with Project Escher

Project Escher is a new technology that combines software and hardware for unprecedented speed, scale and detail in extruded prints. Unlike resin based Ember printers, Project Escher focuses on printing methods like FDM that require pushing material out of a nozzle. It is a parallel processing system where numerous independent extruders collaborate to make one thing, enabling faster print speeds at a large scale without compromising print detail.

Through software and control technology, we're enabling the industry to build a fundamentally new class of printer architecture.



As we continue to work on new advances within the additive manufacturing industry, we aim to help solve some of the industry's most important challenges and change the future making things. For more information about Project Escher, please contact us at projectescher@autodesk.com (mailto:projectescher@autodesk.com? subject=Tell%20me%20more%20about%20project%20Escher.).

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